CLAIMS

WHAT IS CLAIMED:

1. A filtering medium for use in chemical reactors, comprising a plurality of ceramic filter units, at least some of the ceramic filter units having a plurality of openings and at least some of the openings extending therethrough having a shape selected from the group consisting of ellipses and trisoids.

2. The filtering medium of claim **1**, wherein at least some of the ceramic filter units have a thickness of about $^1/_8$ to $1^1/_2$ inches.

3. The filtering medium of claim **1**, wherein at least some of the ceramic filter units have closed plane shaped cross-sectional configuration, each having a width of about $^1/_4$ to 3 inches at the widest point.

4. The filtering medium of claim **1**, wherein at least some of the ceramic filter units have a polygonal cross-sectional configuration having a plurality of sides, the configuration selected from the group consisting of triangles, quadrilaterals, squares, rectangles, pentagons, hexagons, heptagons and octagons, each of the sides having a length of about $^1/_8$ to 3 inches.

5. The filtering medium of claim **1**, wherein at least some of the ceramic filter units have an elliptical cross-sectional configuration selected from the group consisting of ellipses having minor axes ranging from about $^1/_4$ to 2 inches and major axes ranging from about $^3/_8$ to 3 inches and circles having diameters ranging from about $^1/_4$ to 3 inches.

6. The filtering medium of claim **1**, wherein at least some of the ceramic filter units have a fluted surface.

7. The filtering medium of claim **1**, wherein the ceramic filter units have top and bottom surfaces, wherein at least one of the top and bottom surfaces are irregularly shaped.

8. The filtering medium of claim **1**, wherein the at least some of the ceramic filter units have about a 20 to 70 percentage void area.

9. The filtering medium of claim **1**, wherein the ceramic filter units, after being packed into the chemical reactor, form a filtration layer having about a 200 to 500 ft^2/ft^3 packing factor.

10. The filtering medium of claim **1**, wherein the at least some of the ceramic filter units are formed of a ceramic which comprises a substrate having a substantially uniform coating of a selected catalyst including a porous alumina coating with one Group VI-B metal.

11. The filtering medium of claim **10**, wherein the Group VI-B metal is molybdenum.

12. The filtering medium of claim **1**, wherein the at least some of the ceramic filter units comprise a substrate having a substantially uniform coating of a selected catalyst including a porous alumina coating with one Group VIII metal.

13. The filtering medium of claim **12**, wherein a Group VIII metal is nickel or cobalt.

14. The filtering medium of claim **1**, wherein a Group VI-B metal is impregnated into at least some of the ceramic filter units.

15. The filtering medium of claim **1**, wherein a Group VIII metal is impregnated into at least some of the ceramic filter units.

16. The filtering medium of claim **1**, wherein the at least some of the ceramic filter units are formed of a ceramic which contain a porous inorganic oxide selected from the group consisting of alumina, silica, silica-alumina, magnesia, alumina and titania.

17. The filtering medium of claim **1**, wherein the at least some of the ceramic filter units contain a metal oxide selected from the group consisting of titanium, tin, lead, zirconium, ruthenium, tungsten, yttrium, nickel, magnesium, calcium, aluminum, silicon or boron.

18. The filtering medium of claim **1**, wherein the at least some of the ceramic filter units contain a metal nitride selected from the group consisting of titanium, zirconium, tungsten, silicon or boron.

19. The filtering medium of claim **1**, wherein the at least some of the ceramic filter units contain a metal carbide selected from the group consisting of titanium, zirconium, tungsten, silicon or boron.

20. The filtering medium of claim **1**, wherein the at least some of the ceramic filter units contain a metal boride selected from the group consisting of titanium, zirconium or tungsten.

21. The filtering medium of claim **1**, wherein the at least some of the ceramic filter units contain a zeolite selected from the group consisting of zeolite L, zeolite X and zeolite Y.

22. A method of removing contaminants from a contaminated organic-based feed stream, in a chemical reactor, comprising the steps of:

(a) providing a layer of ceramic filter units, at least some of the ceramic filter units having a plurality of openings extending therethrough, at least some of the openings having a shape selected from the group consisting of ellipses and trisoids, the layer of ceramic filter units being in an amount sufficient to filter the contaminant from the organic-based feed stream; and

(b) passing the contaminated organic-based feed stream through the layer of ceramic filter units.

23. A method of removing contaminants from a contaminated organic-based feed stream in a chemical reactor, comprising the steps of:

(a) providing a layer of ceramic filter units, at least some of the ceramic filter units having a plurality of openings extending therethrough, at least some of the openings having a shape selected from a group consisting of ellipses and trisoids ; and

(b) contacting the contaminated organic-based feed stream with the ceramic filter units to remove the contaminants from the contaminated organic-based feed stream.

24. The method of claim **23**, including the step of providing a decontaminated organic-based feed stream for further processing in the chemical reactor.

25. The method of claim **23**, including the step of utilizing at least some ceramic filter units having a thickness of about $^1/_8$ to 1½ inches.

26. The method of claim **23**, including the step of utilizing at least some ceramic filter units having a closed plane shape cross-sectional configuration, each having a width of about $^1/_4$ to 3 inches at the widest point.

27. The method of claim **23**, including the step of utilizing at least some ceramic filter units having a polygonal cross section, selected from the group consisting of triangles, quadrilaterals, squares, rectangles, pentagons, hexagons, heptagons and octagons, each side of the polygon to have a length of about $^1/_8$ to 3 inches.

28. The method of claim **23**, including the step of utilizing at least some ceramic filter units having an elliptical cross section selected from the group consisting of ellipses having minor axes ranging from about $^1/_4$ to 2 inches and major axes ranging from about $^3/_8$ to 3 inches and circles having diameters ranging from about $^1/_4$ to 3 inches.

29. The method of claim **23**, including the step of utilizing at least some ceramic filter units having a fluted surface.

30. The method of claim **23**, including the step of utilizing at least some ceramic filter units having top and bottom surfaces, wherein at least one of the top and bottom surfaces are irregularly shaped.

31. The method of claim **23**, including the step of utilizing at least some ceramic filter units having about a 20 to 70 percentage void area.

32. The method of claim **23**, including the step of utilizing at least some ceramic filter units forming a filtration layer having about a 200 to 500 ft^2/ft^3 packing factor.

33. The method of claim **23**, wherein the step of contacting the contaminated organic-based feed stream with the ceramic filter units includes depositing a catalyst on at least some of the ceramic filter units.

34. The method of claim **23**, including the step of utilizing at least some ceramic filter units as a ceramic substrate having a substantially uniform coating of a selected catalyst including a porous alumina coating with one Group VI-B metal.

35. The method of claim **34**, wherein the Group VI-B metal is molybdenum.

36. The method of claim **23**, including the step of utilizing at least some ceramic filter units as a ceramic substrate having a substantially uniform coating of a selected catalyst including a porous alumina coating with one Group VIII metal.

37. The method of claim **36**, wherein a Group VIII metal is nickel or cobalt.

38. The method of claim **23**, including the step of utilizing a Group VI-B metal impregnated into at least some of the ceramic filter units.

39. The method of claim **23**, including the step of utilizing a Group VIII metal impregnated into at least some of the ceramic filter units.

40. The method of claim **23**, including the step of utilizing at least some ceramic filter units contain a porous inorganic oxide selected from the group consisting of alumina, silica, silica-alumina, magnesia, silica-magnesia and titania.

41. The method of claim **23**, including the step of utilizing at least some ceramic filter units contain a metal oxide selected from the group consisting of titanium, tin, lead, zirconium, ruthenium, tungsten, yttrium, nickel, magnesium, calcium, aluminum, silicon or boron.

42. The method of claim **23**, including the step of utilizing at least some ceramic filter units contain a metal nitride selected from the group consisting of titanium, zirconium, tungsten, silicon or boron.

43. The method of claim **23**, including the step of utilizing at least some ceramic filter units contain a metal carbide selected from the group consisting of titanium, zirconium, tungsten, silicon or boron.

44. The method of claim **23**, including the step of utilizing at least some ceramic filter units contain a metal boride selected from the group consisting of titanium, zirconium or tungsten.

45. The method of claim **23**, including the step of utilizing at least some ceramic filter units contain a zeolite selected from the group consisting of zeolite L, zeolite X and zeolite Y.

46. A method of fluid distribution in a chemical reactor comprising the steps of:

(a) providing a layer of ceramic filter units, at least some of the ceramic filter units having a plurality of openings extending therethrough, and at least some of the openings having a shape selected from the group consisting of ellipses and trisoids, at least some of the ceramic filter units having a plurality of flow passageways defined by the plurality of openings extending through the ceramic filter units;

(b) contacting an organic-based feed stream with the layer of ceramic filter units; and

(c) subdividing the organic-based feed stream into a plurality of smaller fluid streams by passing the organic-based feed stream through the plurality of flow passageways defined by the plurality of openings.

47. The method of claim **46** including the steps of: removing contaminants from a contaminated organic-based feed stream; and providing a decontaminated and uniformly spread organic-based feed stream to a catalyst bed for further processing in the chemical reactor.